

We Claim

1. A wall element for use as part of an inner wall of a gas turbine engine combustor wall structure, the wall element including inner and outer walls defining a space therebetween, the wall element being of cast construction and including a plurality of cooling apertures provided therethrough and formed during the casting process.
2. A wall element according to claim 1, wherein the wall structure is for a combustor arranged to have a general direction of fluid flow therethrough, and the cooling apertures lie in use at an angle of between 10° and 40° to that general direction of fluid flow.
3. A wall element according to claim 1 wherein the wall element includes a plurality of projections which in use extend into the space between the inner and outer walls.
4. A wall element according to claim 1 wherein the wall element comprises a thickened portion, the thickened portion includes the plurality of cooling apertures.
5. A wall element according to claim 4 wherein the thickened portion defines a crescent shape.
6. A wall element according to claim 4 wherein an axis of at least one cooling aperture lies on a line which intersects at least one of the projections.
7. A wall element according to claim 4 wherein the wall element includes one or more generally cylindrical projecting studs, the studs are provided for use in fixing the wall element to the outer wall of the wall structure, and wherein at least one cooling aperture is provided in or near a base region of a stud.
8. A wall element according to claim 4 wherein the wall element includes at least one integrally formed boss for a mixing port, and wherein at least one cooling aperture is provided in or near the boss.
9. A wall element according to claim 8 wherein a cooling aperture is provided in or near a base region of the boss.

10. A wall element according to claim 7 wherein a base region of a stud or of a mixing port boss is extended to provide a land integral with the stud or mixing port boss, and wherein a cooling aperture is provided in the land.

5 11. A wall element for use as part of an inner wall of a gas turbine engine combustor wall structure including inner and outer walls defining a space therebetween, the wall element including a plurality of projections, each projection in use extends into the space between the inner
10 and outer walls and the plurality of cooling apertures extend through the wall element, wherein an axis of at least one aperture lies on a line which intersects at least one projection.

12. A wall element for use as part of an inner wall of a
15 gas turbine engine combustor wall structure including inner and outer walls defining a space therebetween, the wall element including one or more generally cylindrical projecting studs, the studs are provided for use in fixing the wall element to an outer wall of the wall structure,
20 wherein a base region of the stud is extended to provide a land integral with the stud or mixing port boss, and wherein a cooling aperture is provided in the land.

13. A wall element for use as part of an inner wall of a gas turbine engine combustor wall structure including inner
25 and outer walls defining a space therebetween, the wall element including at least one integrally formed boss for a mixing port, wherein a base region of the mixing port boss is extended to provide a land integral with the stud or mixing port boss, and wherein a cooling aperture is
30 provided in the land.

14. A wall element according to claim 12 wherein the cooling aperture is laser drilled.

15. A wall element according to claim 13 wherein the cooling aperture is laser drilled.

35 16. A wall element according to claim 1, the wall element including a plurality of cast cooling apertures and a

plurality of laser drilled cooling apertures.

17. A wall structure for a combustor, the wall structure including inner and outer walls defining a space therebetween and the inner wall including a number of wall elements, one or more of the wall elements being in accordance to claim 1.

18. A gas turbine engine combustion chamber including a wall structure according to claim 17.

19. A method of manufacturing a wall element for use as part of an inner wall of a gas turbine engine combustor wall structure including inner and outer walls defining a space therebetween, wherein the method includes the step of casting a plurality of cooling apertures in the wall element.

20. A method according to claim 19, the method including the step of investment casting the wall element.

21. A method according to claim 20, the method including the steps of providing one or more sprues within a working pattern of the wall element to be cast, and subsequently dissolving the sprues out of the cast wall element, thus forming the cooling apertures.

22. A method according to claim 19, the method including the step of casting a stud or mixing port in the tile, the stud or mixing port including an integrally cast land.

23. A method according to claim 19, the method further including the step of laser drilling a plurality of cooling apertures within the wall element.